These numbers show that the chromospheric spectrum is largely composed of enhanced metallic lines in addition to the lines of hydrogen and the cleveite gases.

In the Fraunhofer spectrum enhanced lines may be regarded as wanting, for in the case of iron and magnesium, at least, they only appear with the feeble intensities which they have in the arc spectrum, while the characteristic arc lines are strong. Here then we find the cause of the dissimilarity of the chromospheric and Fraunhofer spectrum which is indicated by the following figures:—

No. of Fraunhofer lines tabulated by Rowland in the region F to K.	5694
No. of lines photographed in the same region, eclipse 1893	164
Percentage of Fraunhofer lines	3
No. of lines photographed in the same region, eclipse 1896.	464
Percentage of Fraunhofer lines	8

Clearly then, the chromosphere as photographed in the eclipses of 1893 and 1896, is a region of high temperature in which there is a corresponding simplification of spectrum as compared with the cooler region in which the Fraunhofer absorption is produced.

"The Total Solar Eclipse of August 9, 1896. Report on the Expedition to Kiö Island." By J. NORMAN LOCKYER, C.B., F.R.S. Received May 15,—Read June 17, 1897.

(Abstract.)

The observing party consisted of Mr. Fowler, Dr. W. J. Lockyer, and myself, and the selection of Kiö Island as an observing station was rendered possible by the grant of the services of H.M.S. "Volage." Although the expedition failed in its main objects, because of unfavourable weather, it is considered desirable to put on record an account of the arrangements which had been made to secure observations, more especially as a new feature was introduced in the training of a large number of officers and men to take part in the observations.

Profiting by the experience gained in previous eclipses, prismatic cameras of the highest available powers were taken out, as well as a powerful integrating spectroscope. To supplement the work of these photographic instruments, a number of prisms and small slit spectroscopes were provided for use by such assistants as were available. The voluntary services of 74 officers and men of H.M.S.

"Volage" made it possible to extend the original programme so as to include records of all the attendant phenomena.

The paper gives an account of the preparation of instruments and huts, and of the organisation of the "Volage" observers into parties for different branches of the work. For the benefit of others who may be similarly circumstanced on future occasions, full particulars of these working parties and the instructions issued to them are included in the paper, and the arrangements for working the larger instruments are also described.

On the morning of the eclipse the sky was almost entirely overcast, and the sun was quite invisible during totality.

No photographs were obtained, but some observations of temperature, colours of the landscape, and the general phenomena of totality were secured. As shown by two thermometers screened from the direct rays of the sun, the temperature fell 0·9° F. from first contact to totality, and rose the same amount between totality and last contact. A fully exposed thermometer at another place indicated a fall of 6·5° F., and a subsequent rise of 1·5° F. during the same intervals.

"On the Classification of Stars of the δ Cephei Class." By J. NORMAN LOCKYER, C.B., F.R.S. Received May 17,—Read June 17, 1897.

Introduction.

The spectrum of δ Cephei is one of a group with special characteristics. While containing a great number of fine metallic lines, giving it more or less the same general appearance as the solar spectrum, it shows many lines which are either faint in the solar spectrum or are altogether absent. In a former paper* I showed that the spectrum is practically identical with that of γ Cygni, which my previous work had indicated to be a star of increasing temperature.†

The chief argument which I had employed in favour of placing γ Cygni on the ascending side of the temperature curve was based on the presence of certain special lines, which occur with increased importance, in the spectrum of α Cygni, which differs very widely from the solar spectrum, and has a close relationship to the Orion stars.

Further, the association of a special kind of variability with some of the stars having a spectrum of this type seemed to strengthen the view that the constitution of such stars must be vastly different from that of the sun. Dr. Vogel, however, has classified two stars of the same group as δ Cephei, namely, η Aquilæ and 10 Sagittæ,

* 'Roy. Soc. Proc.,' vol. 59, p. 103.

† 'Phil. Trans.,' A, vol. 184, p. 718.